PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference RL.P52872WO	**FOR FURTHER ACTION**	See Form PCT/IPEA/416
International application No. PCT/EP2004/051725	International filing date *(day/month/year)* 05.08.2004	Priority date *(day/month/year)* 12.09.2003
International Patent Classification (IPC) or national classification and IPC H04L12/56, H04Q7/22		
Applicant TELEFONAKTIEBOLAGET LM ERICSSON (PUBL) et al		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 8 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *sent to the applicant and to the International Bureau)* a total of 1 sheets, as follows:
      ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the opinion
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
29.07.2005	28.11.2005
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Möll, H-P Telephone No. +49 89 2399-8243

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2004/051725

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
   - ☐ international search (under Rules 12.3 and 23.1(b))
   - ☐ publication of the international application (under Rule 12.4)
   - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-8	as originally filed

Claims, Numbers

7(part)	as originally filed
1-6, 7(part)	filed with telefax on 16.11.2005

Drawings, Sheets

1/2, 2/2	as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

* *If item 4 applies, some or all of these sheets may be marked "superseded."*

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-7
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-7
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-7
	No:	Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (SEPARATE SHEET)

International application No.
PCT/EP2004/051725

Cited Documents

1. Reference is made to the following documents in this International Preliminary Report on Patentability (IPRP):

D1: "QoS Guaranteeing during UMTS Packet-domain Handover"
SHEN Qingguo et al
Proceedings of the Fourth International Conference on Parallel and Distributed Computing, Applications and Technologies, PDCAT 2003
27-29 Aug. 2003, Chengdu, China
pages 387 - 390

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

A. **Clarity** (Article 6 PCT):

1. **Claims 1 and 4**:

1.1 Essential Features, Article 6 in combination with Rule 6.3(b) PCT

1.1.1 It is clear from the description that it is the central aspect of the present invention that data is transmitted from a first wireless user terminal to a second wireless user terminal over two cascaded radio links and that the **in-sequence delivery option** for the radio link at the **sending side** is **disabled** (see page 6, lines 7-13 and page 2, line 13 - page 3, line 1).

(a) Independent **Claim 1** defines that the in-sequence delivery option of packets between radio network control nodes ... serving the user terminals ... is disabled at a sending radio network control node.

(b) Independent **Claim 4** defines that the in-sequence delivery option is disabled for packets sent from the radio network controller to another radio network controller and associated with a packet switched session between two or more user terminals.

1.1.2 The wording of both independent **Claims 1 and 4** is not sufficiently **clear** (Article 6 PCT) for the following reasons:

The packets that are sent from the first wireless user terminal to the second wireless user terminal are evidently sent over three (3) different link segments, namely the **radio link** at the sending radio network controller, the **radio link** at the receiving radio network controller and the **terrestrial link** between the sending and the receiving radio network controllers (see Fig.2; page 2, line 17 - page 3, line 1; page 6, lines 7-13).

It is **essential** for carrying out the *present invention* that the in-sequence delivery option is disabled for the packets sent over the **radio link** at the sending radio network controller (page 6, lines 10-13; *"... the solution proposed here is to disable the in-sequence delivery option at the RNC of the first radio link ..."*).

This feature is however neither included in independent **Claim 1** nor in independent **Claim 4** in a sufficiently clear manner.

From the wording of independent **Claims 1 and 4** it can be understood that the disabling of the in-sequence delivery option concerns the **terrestrial link** between the sending and the receiving radio network controllers (cf. **Claim 1**, page 8, lines 7-9 and **Claim 4**, page 8, lines 22-25). This is however not supported in the description.

1.1.3 Both **Claims 1 and 4** thus fail to clearly and unambiguously define on which link segment (see item 1.1.2) the in-sequence delivery option is indeed disabled.

Since independent **Claims 1 and 4** do not contain all the **essential** technical features, said independent Claims do not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent Claim must contain all the technical features **essential** to the definition of the invention.

1.2 Conciseness, Article 6 PCT

1.2.1 Independent **Claims 1 and 4** moreover lack **clarity** within the meaning of Article 6 PCT for the following reason:

1.2.2 The two different definitions of the invention given in the two independent method **Claims 1 and 4** presently on file, which are of similar or at least overlapping scope, are such that the Claims as a whole are not **clear** and **concise**, contrary to the requirements of Article 6 PCT.

Indeed, the subject matter represented in the two different independent method Claims overlaps to such an extent that they could have easily been formulated as a single independent Claim in the method category comprising all the features that are **essential** to the definition of the invention (see Rule 6.1(a) PCT and the PCT-International Search and Preliminary Examination Guidelines, Part II, Chapter 5, 5.14 and 5.42).

B. **Novelty / Inventive Step**:

Important Remark:
This evaluation regarding **novelty** and **inventive step** as set out below is carried out as if the **clarity problems** indicated above under "A. **Clarity**" had been corrected by way of amendment.

1. The present International Application relates to a "method of optimising the use of radio resources in a mobile communication system" according to independent **Claim 1** and a "method of operating a radio network controller" according to independent **Claim 4**.

The application concerns a specific situation in which data is transmitted from a first wireless user terminal to a second wireless user terminal over two cascaded radio links, i.e. a "mobile-to-mobile"-call is concerned.
A first radio link is thus existing at the **sending** side between the first wireless user terminal and a **sending** radio network control node and a second radio link is existing at the **receiving** side between the second wireless user terminal and a **receiving** radio network control node. In particular, a combinational multimedia

session is concerned, i.e. in parallel to an ongoing circuit switched session between the two user terminals, an additional (unidirectional) flow of information is setup from the first wireless user terminal to the second wireless user terminal. The *present invention* starts from the finding that in the described scenario the RLC buffers at the **receiving** radio network control node may become empty ("drain") due to retransmission requirements at the radio link at the **sending** side.

2. The present application deals with the *technical problem* of optimising the radio link performance of the radio link at the receiving side in such a situation.

3. The present application solves the above-mentioned *technical problem* by disabling the in-sequence delivery option for the packets sent over the **radio link** at the sending side.

4. The closest prior art document **D1** also discloses the drawbacks of "draining" RLC buffers and proposes to use out-of-sequence delivery of RLC packets. The solution proposed in document **D1** however applies to a different situation, namely a streaming service to a mobile station over one single radio link. **D1** furthermore in particular mentions that "buffer draining" in the mobile station caused by retransmissions on the radio link of this mobile station should be avoided. This is contrary to the *present invention* where "buffer draining" in the **receiving** radio network control node caused by retransmissions on the radio link at the **sending** radio network control node should be avoided. **D1** thus evidently solves a *different technical problem* in a *different situation*.

5. It is concluded that the available prior art documents do not disclose or suggest - neither alone nor in combination - this specific implementation as defined in independent **Claims 1 and 4**.

   Independent **Claims 1 and 4** thus meet the requirements of Article 33(2) and (3) PCT regarding **novelty** and **inventive step**.

6. As a consequence, **Claims 2,3 and 5,6,7**, as being directly or indirectly dependent on **Claim 1** or **Claim 4** respectively, also meet the requirements of Article 33(2) and

(3) PCT regarding **novelty** and **inventive step**.

C. Further Deficiencies / Defects:

1. The opening part of the description on pages 3 and 4 should have been brought into agreement with the wording of the present Claims (Rule 5.1.(a) (iii) PCT).

2. Contrary to the requirements of Rule 5.1.(a) (ii) PCT, the relevant background art disclosed in the documents **D1-D3** noted above is not mentioned in the description, nor are these documents identified therein.

3. The drawings sheets 1/2-2/2 do not meet the requirements of Rule 11.2(a) PCT ("Physical Requirements of the International Application" / "Fitness for Reproduction") and Rule 11.13 (a), (c), (h) ("Special Requirements for Drawings").

CLAIMS:

1. A method of optimising the use of radio resources in a mobile radio communication system during a combinational multimedia session involving circuit switched and packet switched sessions between user terminals associated with respective radio network control nodes, where signals are transported over two cascaded radio links, the method comprising:

at a sending radio network control node, disabling an in-sequence delivery option of packets between the radio network control nodes of the radio access network(s) serving the user terminals for said packet switched session.

2. A method according to claim 1, wherein said packets are Service Data Units, assembled at the RLC layer of the sending side radio network controller, from Protocol Data Units.

3. A method according to claim 1, wherein said packets are Radio Link Control Protocol Data Units which are tunnelled from the sending side radio network controller to the receiving side radio network controller, the Protocol Data Units being assembled at the receiving side terminal into Radio Link Control Service Data Units.

4. A method of operating a radio network controller of a mobile communications network, the method comprising disabling an in-sequence delivery option for packets sent from the radio network controller to another radio network controller and associated with a packet switched session between two or more user terminals.

5. A method according to claim 4, the in-sequence delivery option being an option of the Radio Link Control layer.

6. A method according to claim 5, wherein said packets are Radio Link Control Service Data Units.

7. A method according to claim 5, wherein said packets are Radio Link Control Protocol Data Units which are tunnelled from the sending side radio